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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

TULLOCH et al		Atty. Ref.:	**540-161**
Serial No.	**09/437,226**	Group:	**2829**
Filed:	**November 10, 1999**	Examiner:	**P. Patel**

For: **THERMOGRAPHIC WIRING INSPECTION**

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APPEAL BRIEF

On Appeal From Group Art Unit 2829

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I. REAL PARTY IN INTEREST

The real party in interest in the above-identified appeal is BAE SYSTEMS plc by virtue of the Assignment from the inventors to British Aerospace Public Limited Company recorded November 1, 1999, at Reel 10393, Frame 0719, and a name change from British Aerospace Public Limited Company to BAE SYSTEMS plc recorded October 12, 2000, at Reel 11195, Frame 0065.

II. RELATED APPEALS AND INTERFERENCES

Appellants note a previous Notice of Appeal in this application, with the Notice of Appeal filed April 26, 2002, and the Appeal Brief filed June 26, 2002. Apparently, in response to the Appeal Brief, the Examiner agrees that there is no basis for rejecting the claims under any combination of the Elabd (U.S. Patent 4,584,523), Wood (U.S. Patent 4,473,795), Gazdzinski (U.S. Patent 6,144,032) and Singh (U.S. Patent 5,624,928) references either together or in combination with Marquez-Lucero (U.S. Patent 5,574,377) or Piety (U.S. Patent 5,637,871). Appellant notes that, in the new non-final rejection, the same claim groupings are utilized, but the Examiner has dropped the rejections based upon the previously cited references and instead has substituted two new references. Thus, the previous Final Rejection and the Appeal Brief responsive thereto is believed related to the present appeal.

There are believed to be no related interferences with respect to the present application and appeal.

III. STATUS OF CLAIMS

Claims 1-25 stand rejected in the outstanding non-Final rejection. The Examiner contends that claims 1-125 are obvious USC §103 in view of the various combinations of cited prior art.

IV. STATUS OF AMENDMENTS

No further response has been submitted with respect to the non-Final Official Action in this application.

V. SUMMARY OF THE INVENTION

The present invention relates to a method for inspecting and testing the integrity of insulation on an insulated wire or cable.

Electrical wires or cables often are protected from short circuit by non-conductive insulation surrounding the wire or cable. While continuity along the wire can be tested easily, the integrity of the insulation cannot so easily be tested. In the past, visual checks to the external insulation of the wire or cable do not necessarily provide a good indication of its integrity. This is particularly true where a number of cables are bundled together in a wiring loom where portions of the wire may be hidden by other wires or structural members.

One known method of testing such preinstalled wires or cables is to apply a predetermined current to the wire and use an infrared detector to determine thermal energy emanating from the wire along its length. Where the insulation is intact, the thermal emissions are lower than the emissions might be for areas with insulation damage. The amount heat radiated by the wire and thus detected by the detector is proportional to the thickness of the insulator and thus partially damaged insulation in wires can be detected and monitored in use and replaced if need be.

Unfortunately, such detectors also suffer from the problem that infrared detectors operate generally on a line of sight basis. If a portion of the insulation away from the detector has been damaged, the detector may not show the damage or at least indicate the extent of the damage that it would otherwise indicate if the defect was pointed towards the detector. It is often not possible to position detection apparatus around a wire, especially where wires or cables are fixed to run along a wall or structural member or there is little room for detection apparatus or its installation.

Appellants found that the addition of an electrolyte liquid sprayed around the wire allows leakage current to flow around the insulated wire and between damaged sites, creating a more significant heat image than would otherwise be present and thereby enabling hidden damage sites to be detected. Thus, installed

wiring including wiring looms and bundles can be easily checked to determine if the insulation has been compromised.

Accordingly, the present invention, which is a "method for **inspecting the integrity of insulation** of an insulated wire or cable," comprises the steps of **"passing a current through said wire or cable," "applying a fluid having electrolytic properties to said wire or cable"** and **"using a thermal imaging system to detect and display the intensity of heat emanating from said wire or cable."**

VI. ISSUES

Whether claims 1, 2, 4-7, 12-14 and 16-25 are obvious under 35 USC §103 over Cahill ("Aircraft electrical Wet-Wire Arc Tracking") in view of Ogura ("Development of Thermographic NDT for the Damage Inspection in Carbon Fiber Reinforced Plastics").

Whether claim 15 is obvious under 35 USC §103 over the Cahill/Ogura combination, further in view of Marquez-Lucero (U.S. Patent 5,574,377).

Whether claims 3 and 8-11 are obvious under 35 USC §103 over the Cahill/Ogura combination, further in view of Piety (U.S. Patent 5,637,871).

VII. GROUPING OF CLAIMS

The rejected claims stand or fall together.

VIII. ARGUMENT

1. Discussion of the References

Cahill ("Aircraft Electrical Wet-Wire Arc Tracking) is an article detailing the testing of different insulation to determine their resistance to thermal degradation of the insulation material. During the testing, as pointed out by the Examiner, current is passed through the wire and a fluid having electrolytic properties is applied to the wire. However, in order to promote leakage currents and thus surface discharges which cause degradation of the thermal insulation (which is the parameter being tested), the Cahill wires under test have cuts made in the insulation such that "about 1.2 millimeters (mm) of conductor" was exposed. The fact that Cahill requires the cutting of each of the wires' insulation so as to expose the wires themselves is apparently ignored in the Examiner's analysis of the Cahill reference.

Moreover, the Examiner mischaracterizes Cahill as a "method for inspecting the integrity of insulation." Cahill actually and intentionally cuts away or breaches the insulation on the wires under test and therefore starts with a known non-integral insulation and tests the effects of a breach in insulation on a wire bundle.

Because Cahill intentionally breaches the integrity of the wire insulation under test, it cannot be considered a method for inspecting integrity of insulation.

Moreover, it is concerned with the consequences of a breach in integrity (the thermal degradation of other and adjacent insulation) and is not at all concerned with any method of inspecting the integrity of existing insulation.

Moreover, the Examiner admits that "Cahill does not explicitly disclose, using a thermal imaging system to detect and display the intensity of heat emanating from said wire or cable." Thus, Cahill is not concerned with a method for inspecting integrity of insulation and does not use any method of thermal imaging to detect and display heat emanating from the wire or cable.

Cahill is directed only to the problem of evaluating different types of insulation as to their resistance against thermal degradation caused by wet-wire arcing and is unrelated to the problem of evaluating the integrity of insulation on a wire or cable.

Ogura ("Development of Thermographic NDT For the Damage Inspection in Carbon Fiber Reinforced Plastics") is apparently cited by the Examiner for the teaching of thermal imaging. However, the Examiner mistakenly suggests that Ogura "discloses use of a thermal imaging system to detect and display the intensity of heat emanating from **insulated wire or cable** [fig.1-2 and lines 9-17 on page 422]" (emphasis added). However, a brief review of the Ogura reference will show that it has nothing to do with insulated wires or cables and instead is directed to the non-destructive testing of carbon fiber reinforced panels.

While the Examiner refers to Fig. 1 in Ogura, it is noted that Fig. 1 shows a carbon fiber reinforced plastic panel using a resistive heating and analyzing temperature differences across the panel. Fig. 2 also referred to by the Examiner either blows hot air on the top of the panel being viewed or applies a heater to the bottom of the panel being used. To the extent there is a delamination, the material above the delamination is heated at a faster rate than the laminated material, providing a higher than normal temperature reading for the imaging system, or where the heater is under the delamination, the delamination acts as an insulator providing a lower than ambient temperature when viewed by the imager.

In neither of Figs. 1 and 2 of Ogura is there any disclosure of a general method for inspecting the integrity of insulation, nor is there any disclosure of the step of passing a current through a wire or cable or applying a fluid having electrolytic properties to the wire or cable and then using thermal imaging. While thermal imaging by itself is well known in the art and is used and taught in the Ogura reference, its teaching is for an entirely different reason than that in the claimed invention, and in Ogura it is limited to the disclosure of voids and delaminations in carbon fiber reinforced plastic panels.

Ogura is directed to solving the problem of determining the existence of voids contained in carbon fiber reinforced panels and is unrelated to any evaluation of the integrity of insulation on a wire or cable.

Marquez-Lucero (U.S. Patent 5,574,377) teaches a device and method for the detection and localization of organic solvent leakages. An electrical conductor is enclosed in an organic solvent leakage detector cable. The conductor is comprised of a composite material formed by a solvent soluble or swellable thermoplastic matrix containing conductive particles. When a solvent leak occurs, the solvent interacts with the cable, causing it to swell or dissolve whereupon the conductive particles in the matrix lose contact with each other and cause the cable to diminish or lose its electrical conductivity. Pulses sent along the cable are reflected back from any point at which the cable conductivity changes, therefore providing an indication of where the leak has occurred.

Marquez-Lucero has nothing to do with any method for inspecting the integrity of insulation of an insulated wire or cable. It does not teach the step of passing a current through the wire or cable or the step of applying a fluid having electrolytic properties to the wire or cable. It does not teach the step of using a thermal imaging system to detect or display the intensity of heat emanating from the wire or cable.

Piety (U.S. Patent 5,637,871) teaches a portable digital infrared thermography system utilizing an infrared camera and a digital video data recorder.

Piety does not disclose any method for inspecting the integrity of insulation on an insulated wire or cable. Piety does not disclose the passage of current

through a wire or cable under test. Additionally, Piety does not apply a fluid having electrolytic properties to any wire or cable, nor does it specifically teach the use of its thermal imaging system for the detection and display of the intensity of heat emanating from a wire or cable under test.

2. Discussion of the Rejections

Claims 1, 2, 4-7, 12-14 and 16-25 stand rejected under 35 USC §103 as being unpatentable over Cahill in view of Ogura. To the extent the Examiner's rejection is understood, he appears to believe that Cahill teaches the claimed method of inspecting the integrity of insulated wire, but admits that Cahill does not disclose "using a thermal imaging system to detect and display the intensity of heat emanating from said wire or cable." The Examiner then appears to rely on the Ogura reference teaching the conventional thermal imaging of panels, not wire or cables. Finally, without any specifically enumerated motivation, the Examiner apparently assumes that it would be obvious to combine Cahill and Ogura.

Claim 15 stands rejected under 35 USC §103 as unpatentable over the Cahill/Ogura combination and further in view of Marquez-Lucero. The Examiner admits that "Cahill and Ogura does not explicitly disclose said leakage current measuring means comprises an oscilloscope." The Examiner cites Marquez-Lucero for disclosing an oscilloscope and, without any disclosed motivation,

suggests that it would be obvious to combine Cahill/Ogura and the Marquez-Lucero references.

Claims 3 and 8-11 stand rejected under 35 USC §103 as unpatentable over the Cahill/Ogura combination further in view of Piety. The Examiner admits that "Ogura and Cahill does not explicitly disclose a recording means are provided for recording images displayed by the thermal imaging system." The Examiner is apparently of the opinion that Piety discloses the alleged missing features from the Cahill/Ogura combination and that, without any specified motivation, suggests that it would be obvious to combine Piety with the Cahill/Ogura combination.

3. The Errors in the Final Rejection

There are three main errors in the Rejection and they are summarized as follows:

(a) The Examiner misapprehends the teachings of the Cahill and Ogura references;

1. Cahill does not inspect -- it destructively tests wire insulation;
2. Ogura deals with CRFP panels and not wire or cables.

(b) None of the prior art references recognize the problem solved by appellants' combination of method steps;

(c) The Examiner has failed to provide any reason for combining any of the cited references;

(d) Each of the prior art references teach away from appellants' claimed method.

(a) The Examiner misapprehends the teachings of the Cahill and Ogura references

Central to the errors of the Examiner in the outstanding Official Action, the Examiner has misapprehended the teaching of the two primarily cited prior art references. The following is a detailed discussion of these errors on the part of the Examiner.

1. Cahill does not inspect -- it destructively tests wire insulation

On page 3, lines 1 and 2, the Examiner states that Cahill discloses "a method for inspecting the integrity of insulation of an insulated wire or cable" and cites the abstract on page 1. this is completely incorrect as a review of the cited portion of the abstract (on page 1) will indicate that the testing is with respect to electrical wet-wire arc tracking and a consequence of wet-wire arcing is highly localized temperatures on the order of 1000°C. Thus, Cahill describes the problem: high temperatures causing degradation of the wire insulation ("temperatures of this magnitude will cause thermal degradation of the insulation material, the nature of which depends on the insulation material used.").

Additionally, the abstract goes on to state that the FAA conducted bench tests which demonstrated that the ability of aircraft wire to resist wet arc tracking

and possible flashover "is highly dependent on the composition of the wire insulation." Reading beyond the abstract and looking at the portion entitled "Experimental Test Setup," it is noted that **in every** sample of wires tested "[t]wo of the wires had circumferential cuts made approximately midway in their length exposing about 1.2 millimeters (mm) of conductor." In other words, the wires under test had the wire insulation breached intentionally so as to cause wet-wire arcing, and the tests were to determine the consequences of such arcing on various types of insulation. Clearly the Examiner's initial contention that Cahill teaches a method for inspecting the integrity of insulation is patently false.

The Examiner is correct that part of Cahill's insulation degradation tests involved passing a current through the wires. However, this was not to inspect the integrity of insulation, but rather to cause wet-wire arcing to determine the thermal damage to the insulation under test.

The Examiner also correctly notes that Cahill discloses applying a fluid having electrolytic properties to the wire or cable. Again, this was applied in a method for determining the thermal degradation caused by wet-wire arcing to existing insulation with a known breach in the integrity of that insulation. This is a far cry from a method for inspecting the integrity of insulation of an insulated wire or cable. Cahill requires intentional breaches in the insulation and then determines the effect of wet-wire arcing.

Appellants' claim 1 is a method for inspecting the integrity of insulation, i.e. unbreached wire insulation. Thus, the Examiner's conclusion that Cahill somehow teaches a "method for inspecting the integrity of insulation" is simply not supported by any disclosure in the Cahill reference, as Cahill is directed to destructive testing of wire insulation, not the testing of integrity of insulated wire. Cahill doesn't have to test the integrity of the wire, because it already knows that the wire has been intentionally breached in order to cause the wet-wire arcing needed to provide the high temperatures for insulation evaluation.

2. Ogura deals with CRFP panels and not wire or cables

The Examiner states that Ogura "discloses use of a thermal imaging system to detect and display the intensity of heat emanating from insulated wire or cable [fig. 1-2 and lines 9-17 on page 422]." Again, the Examiner misapprehends the teaching of the Ogura reference. At no place is there any indication that Ogura has any interest in "insulated wire or cable" as contended by the Examiner.

Figs. 1 and 2 cited by the Examiner illustrate Carbon Fiber Reinforced Plastic (CFRP) panel samples which are tested by resistive heating in Fig. 1 and by a thermographic insulation method in Figs. 2a and 2b. Nowhere is there disclosed an "insulated wire or cable."

Moreover, appellants' specification discloses that such prior art testing, even of wires and cables, is known in the art (making appellants' acknowledged prior art

more pertinent than the Ogura reference). Appellants have noted on page 2, first full paragraph, that the heat radiated by wire is proportional to the thickness of the insulation and if insulation is damaged a greater amount of heat radiation can be detected by use of an infrared detector. This is also discussed in the paragraph bridging pages 2 and 3 of the present specification.

The first full paragraph on page 3 of the present specification details disadvantages with such known existing systems. Thus, appellants admit that the existing systems for inspecting the integrity of insulation of an insulated wire or cable includes the steps of passing a current through the wire or cable and using an infrared detector to detect the heat emanating from the wire or cable.

What is missing from the known prior art is the use of a fluid having electrolytic properties and the application of that fluid to the wire or cable. As appellants have found and disclosed in the specification, heat dissipated by leakage current through the electrolytic fluid can be easily detected from an insulation breach, even if the breach is hidden from view of an operator. Thus, the presently claimed invention will find insulation damage which will not be seen in the conventional prior art testing and/or visual inspection by maintenance personnel.

Thus, the Examiner misapplies the Ogura reference which has nothing to do with wires and cables and in any event is not as pertinent as the admitted prior art in appellants' specification.

(b) None of the prior art references recognize the problem solved by appellants' combination of method steps

It is noted that each of the rejections contained in the outstanding Official Action is based upon 35 USC §103, i.e. obviousness in view of cited prior art. Appellants contend that the Examiner, in combining two or more references in order to reject the claims in this case, is picking and choosing method steps from various prior art references and then, with 20/20 hindsight, combining those elements in the manner of appellants' method claims.

The Court of Appeals for the Federal Circuit with respect to such hindsight practice has stated

> "to prevent the use of hindsight based on the invention to defeat patentability of the invention, this court **requires** the examiner to show a motivation to combine the references that create the case of obviousness. In other words, **the Examiner must show reasons** that the skilled artisan, **confronted with the same problems as the inventor** and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." (emphasis added).*In re Rouffet*, 47 USPQ2d 1453, 1457-8 (Fed. Cir. 1998).

None of the cited references recognize or even suggest that there is a problem in terms of the inspection of the integrity of insulation for an insulated wire or cable nor is either reference directed to any solution of such problem.

As noted above, Cahill is not a method for inspecting the integrity of insulation, but rather is a test method for evaluating thermal damage to different types of insulation caused by wet-wire arcing, and during the test method, the

integrity of the insulation is intentionally breached so as to promote the wet-wire arcing needed for thermal degradation. Thus, the problem solved by Cahill deals only with thermal degradation testing of the insulation.

Ogura, as noted above, deals only with the non-destructive testing of CFRP panels to determine the existence of delaminations therein. Appellants' specification acknowledges that thermal imaging is a well-known method for non-destructive testing. However, Ogura does not add anything more than this acknowledge prior art and indeed is substantially less pertinent. The problem solved by Ogura bears no relationship to the problem addressed by appellants' claimed invention.

The Marquez-Lucero reference has nothing to do with the integrity of insulation of insulated wire or cable and instead is a device for monitoring a tank or other structure to disclose the existence and location of organic solvent leaks.

Piety, while teaching a thermal imaging system, has no disclosure relating to any possible application of such a system for inspecting the integrity of insulation of an insulated wire or cable and certainly fails to disclose any sequence of steps for the purpose of inspecting insulation integrity.

Because none of the four cited references recognizes the problem of inspecting the integrity of wire insulation, none of the four references relate to the problem solved by the present invention.

The Examiner has simply failed to "show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." *Id.*

The Court of Appeals for the Federal Circuit has held that "the PTO has the burden under §103 to establish a *prima facie* case of obviousness." *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Because the burden of establishing a *prima facie* case of obviousness is on the Examiner and because he has failed meet this burden, there is simply no basis for a rejection of appellants' claims 1-25, as the problem solved by appellants' method (not even mentioning the method) is not addressed in any of the four references.

(c) The Examiner has failed to provide any reason for combining any of the cited references

The Court of Appeals for the Federal Circuit also has stated that the Patent Office can satisfy its burden of proof "only by showing some objective teaching in the prior art." *In re Fine*, at 1598. This section means that the Examiner must show that appellants' method steps are taught in the prior art references. The claimed method step are not present in the prior art references.

Cahill fails to disclose any method for inspecting the integrity of insulation. Rather, Cahill is directed to an intentional breach of the integrity of insulation in

order to promote wet-wire arcing so as to test the resistance to thermal degradation of different types of insulation.

Ogura does not relate to the testing of insulated wire or cable and instead uses a thermal imaging system to detect and display the existence of delamination in CRPF panels.

Marquez-Lucero has no disclosure of any method for inspecting insulated wire, passing current through the wire, applying a fluid to the wire or using a thermal imaging system.

Piety teaches a thermal imaging system, but it has nothing to do with inspecting an insulated wire, passing a current through the wire or applying a fluid having electrolytic properties to the wire.

None of applicants' specifically claimed method steps are disclosed in any of the four cited prior art references. As a result, the Patent Office has failed to meet its burden of showing any "objective teaching in the prior art."

Even if the Patent Office were to have met its burden of showing that there is some teaching in the prior art, it then has the additional burden of showing some motivation for combining those references. As noted above, because none of the prior art references recognize or attempt to solve the problem solved by appellants' invention, there can be no motivation. The Federal Circuit has consistently held

that "teachings of references can be combined only if there is some suggestion or incentive to do so." *In re Fine*, at 1599.

Here the Examiner has provided no indication of any suggestion or motivation for one of ordinary skill in the art to combine three or more unrelated prior art references. The Examiner merely concludes, without any support, that it would be "obvious" for one of ordinary skill in the art to combine the bits and pieces from the various references. Of course, this is a perfect example of prohibited "20/20" hindsight reasoning.

(d) Each of the prior art references teach away from appellants' claimed method

The Court of Appeals for the Federal Circuit has consistently held that it is "error to find obviousness where references 'diverge from and teach away from the invention at hand.'" *Id.* The only one of the cited prior art references that has anything to do with insulation is the Cahill reference, and this is directed towards **a method for evaluating various types of insulation** and their resistance to thermal degradation caused by wet-wire arcing **by initially breaching the wires insulation**.

Appellants' claimed invention is a **method for inspecting the integrity of insulation of an insulated wire or cable**. Cahill does not inspect the integrity of insulation, because it purposely breaches that insulation to promote the wet-wire

arcing needed for its thermal degradation resistance tests. As a result, Cahill would clearly lead one of ordinary skill in the art away from appellants' claimed method.

Ogura would lead one of ordinary skill in the art away from appellants' claimed invention, as it has no need to apply a fluid having electrolytic properties and teaches that a proper evaluation can take place without fluid. Ogura isn't even concerned with wires or cables or their insulation and rather uses thermal imaging to determine the existence and location of delaminations in a carbon fiber reinforced plastic. Ogura would lead one of ordinary skill in the art away from applying a fluid having electrolytic properties.

Thus, both primary references would lead one of ordinary skill in the art away from appellants' claimed combination of method steps and therefore indicate the clear non-obviousness of appellants' invention as characterized by claims 1-25.

IX. CONCLUSION

The present rejection is based upon the erroneous combination of two references. The Examiner's analysis of the teachings contained in each of the references is incorrect, in that one reference (Cahill) deals with the intentional destruction of the integrity of insulation of the wire (in order to promote wet-wire arcing to evaluate thermal degradation of insulation) and the other reference (Ogura) does not have anything to do with applying an electrolytic fluid to a wire

or cable and instead relates to the determining of delaminations in a CFRP panel. In addition to the Examiner's faulty analysis of the cited prior art references, he has failed to provide any motivation for combining the two references and has apparently ignored the fact that the two references would actually lead one of ordinary skill in the art away from Appellants' claimed method.

Thus, and in view of the above, the rejection of claims 1-25 over the cited prior art combinations is clearly an erroneous analysis of the teachings of the references, a hindsight combination without any motivation and is in error, and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

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SCS:kmm
Enclosures
Appendix A - Claims on Appeal

APPENDIX A

Claims on Appeal

1. A method for inspecting the integrity of insulation of an insulated wire or cable including the steps of;

passing a current through said wire or cable,

applying a fluid having electrolytic properties to said wire or cable, and

using a thermal imaging system to detect and display the intensity of heat emanating from said wire or cable.

2. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein the thermal imaging system comprises an infra-red detector and a display monitor.

3. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein recording means are provided for recording images displayed by the thermal imaging system.

4. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 2 wherein the infra-red detector is a thermal imaging camera.

5. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 2 wherein the infra-red detector is hand held.

6. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 2 wherein the infra-red detector is stand mounted.

7. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 2 wherein said infra-red detector is capable of detecting temperature changes of less than 0.5^{o}C.

8. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 3 wherein said recording means is adapted to allow displayed images to be stored on computer disks.

9. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 3 wherein said recording means is adapted to allow images to be stored on video tape.

10. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 3 wherein said images are displayed as calibrated spacial thermal images.

11. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 3 wherein a false colour scale is used to represent various temperatures on displayed images.

12. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said fluid is capable of conducting a leakage current.

13. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 12 wherein leakage current measuring means are provided to measure said leakage current.

14. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 13, wherein said leakage current measuring means comprises an ammeter.

15. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 13, whereas said leakage current measuring means comprises an oscilloscope.

16. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said fluid is an aqueous saline solution.

17. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said fluid comprises sodium chloride in the range 1 to 3% by mass.

18. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said fluid comprises 2% sodium chloride by mass.

19. A method of inspecting the integrity of the insulation of a wire or cable as claimed in claims 1 wherein said fluid comprises ammonium chloride in the range 1 to 3% by mass.

20. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said fluid is dripped on to the wire or cable.

21. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said fluid is sprayed on to the wire or cable.

22. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said fluid includes a wetting agent, said wetting agent being capable of reducing the surface tension of the fluid and thereby preventing large droplets from forming.

23. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said fluid is non-corrosive and is of a type that causes no substantial degradation of elastomeric polymer insulation around any wires or cables to which it is applied.

24. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 1 wherein said thermal imaging system is used to detect and display the intensity of heat emanating from the wire or cable prior to the application of said fluid, to provide datum values of heat emission.

25. A method for inspecting the integrity of the insulation of a wire or cable as claimed in claim 24 wherein the amount of fluid used is dependent upon said datum values.